Roanoke River Community Meeting: AGENDA

1. Welcome
   - Housekeeping items
2. Background on Clean Up Plan Development
   - Mary Dail, Virginia Department of Environmental Quality
3. Highlights from Roanoke River Clean Up Plan Part I (Mainstem Roanoke)
   - Nick Tatalovich, The Louis Berger Group
4. Roanoke Valley Alleghany Regional Commission Initiatives
   - Shane Sawyer, RVARC
5. General Questions
6. Informational Tables & Specific Questions

TWO PLANS FOR CLEAN WATER:

ROANOKE RIVER WATERSHED CLEAN-UP PLAN, NORTH FORK & SOUTH FORK ROANOKE RIVERS CLEAN-UP PLAN

Mary Dail

DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

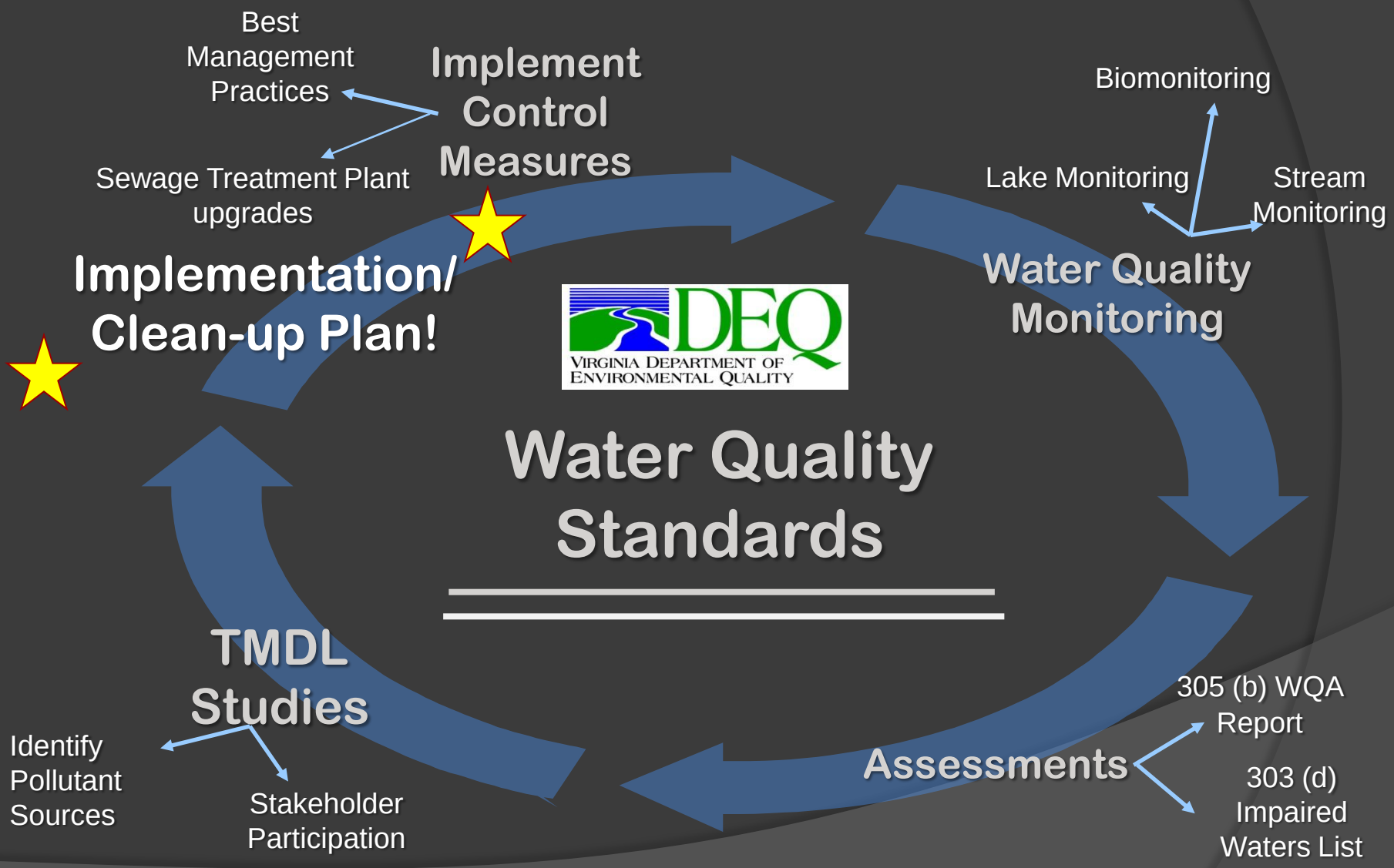
Nick Tatalovich

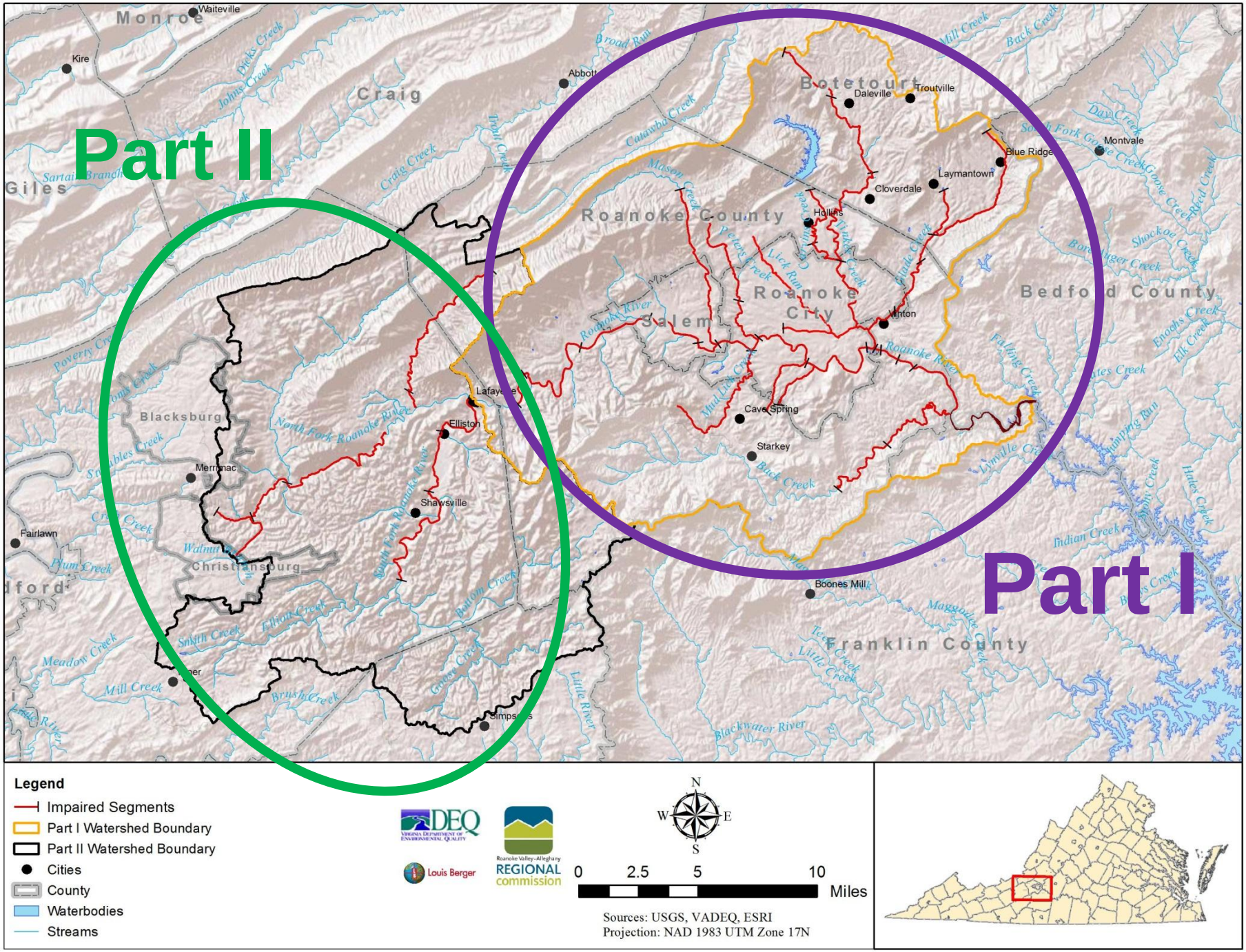
Louis Berger

Acknowledgements

- Blue Ridge, Mountain Castles and Skyline Soil and Water Conservation Districts
- Working group and steering committee members
- Roanoke Valley Alleghany Regional Commission
- City of Roanoke
- Meadowbrook Center, George Smith and Paul Jenkins
- Roanoke Outside
- VA Department of Conservation and Recreation

The Big Picture




Part II
Part I
Waiteville
Monroe
Kire
Craig
Giles
Abbott
Broad Run
Mill Creek
Back Creek
Dicks Creek
Johns Creek
Craig Creek
Trout Creek
Catawba Creek
Mason Creek
Botetourt
Daleville
Troutville
Blue Ridge
Montvale
Laymantown
Cloverdale
Hollins
Roanoke County
Peters Creek
Lick Run
Tinker Creek
Glade Creek
Roanoke City
Salem
Roanoke River
Vinton
Bedford County
Shockoe Creek
Enochs Creek
Elk Creek
Falling Creek
Cave Spring
Starkey
Black Creek
Mud Lick Creek
Blacksburg
North Fork Roanoke River
Elliston
Lafayette
Merrimac
Shawsville
South Fork Roanoke River
Fairlawn
Christiansburg
Walnut Creek
Plum Creek
Stroubles Creek
Toms Creek
Poverty Creek
Buffalo Creek
Elliotts Creek
Bottom Creek
Smith Creek
Meadow Creek
Mill Creek
Brush Creek
Goose Creek
Little River
Simpson
Boones Mill
Franklin County
Maggodee Creek
Teel Creek
Little Creek
Blackwater River
Indian Creek
Hales Creek
Jumping Run
Lynville Creek
Legend
Impaired Segments
Part I Watershed Boundary
Part II Watershed Boundary
Cities
County
Waterbodies
Streams
DEQ
Virginia Department of Environmental Quality
Louis Berger
Roanoke Valley-Alleghany
REGIONAL
commission
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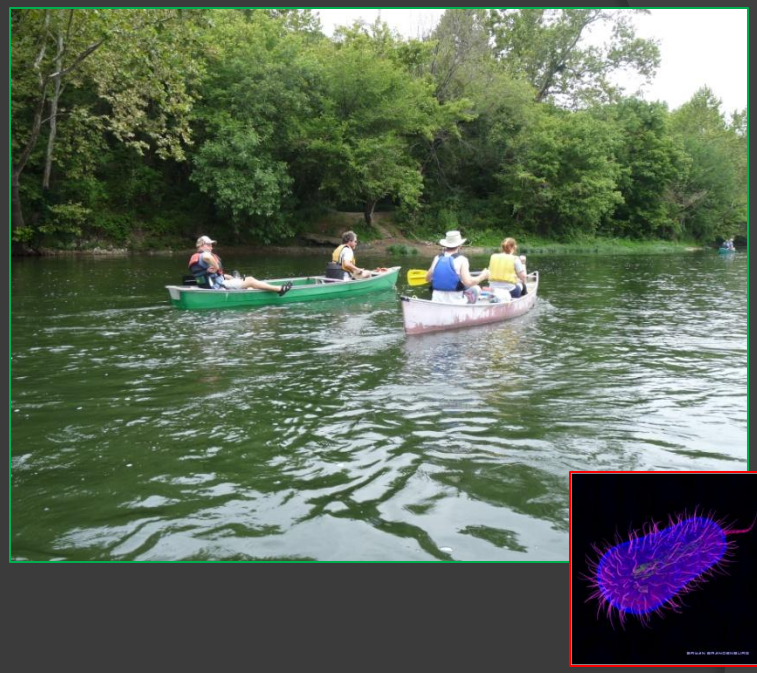
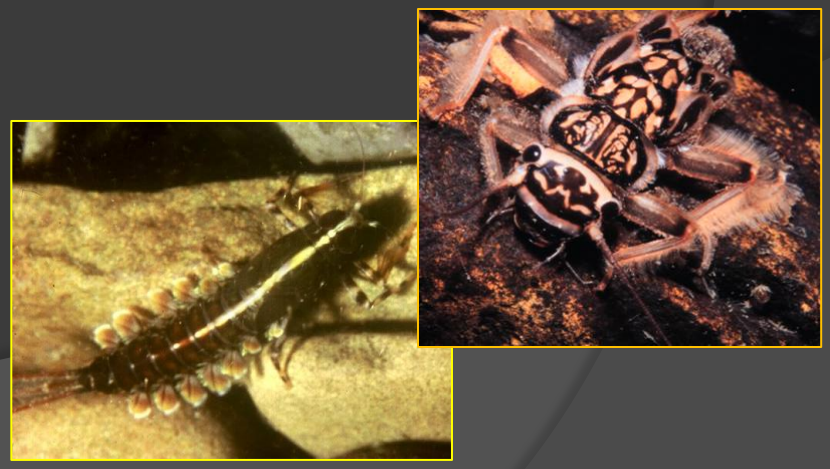
10
Miles
Sources: USGS, VADEQ, ESRI
Projection: NAD 1983 UTM Zone 17N

Why do we need a plan for clean water?

- Too much *E.coli*
  - Human health concern
    - Risk based standard
  - Indicator of pathogens in the water (viruses, protozoans, bacteria)
  - Impacts on livestock
    - cattle diseases transmitted through fecal oral pathway
- Too much sediment
  - Clogs the spaces between rocks causing a shift in aquatic life communities





Where are we now?

The Planning Process in Roanoke River Watershed

- Watershed studies completed in 2004 and 2006
- Identified sources of bacteria & sediment in the watersheds, their contributions and the reductions needed
- Kicked off development of Part I Clean Up Plan in June 2013
  - Working group and steering committee meetings over the past 2 years
  - Draft plan has been completed, 30-day public comment period starts tomorrow
- Part II Clean Up Plan development starts tonight!
  - Working Group formation (sign-ups available)
  - Informational tables

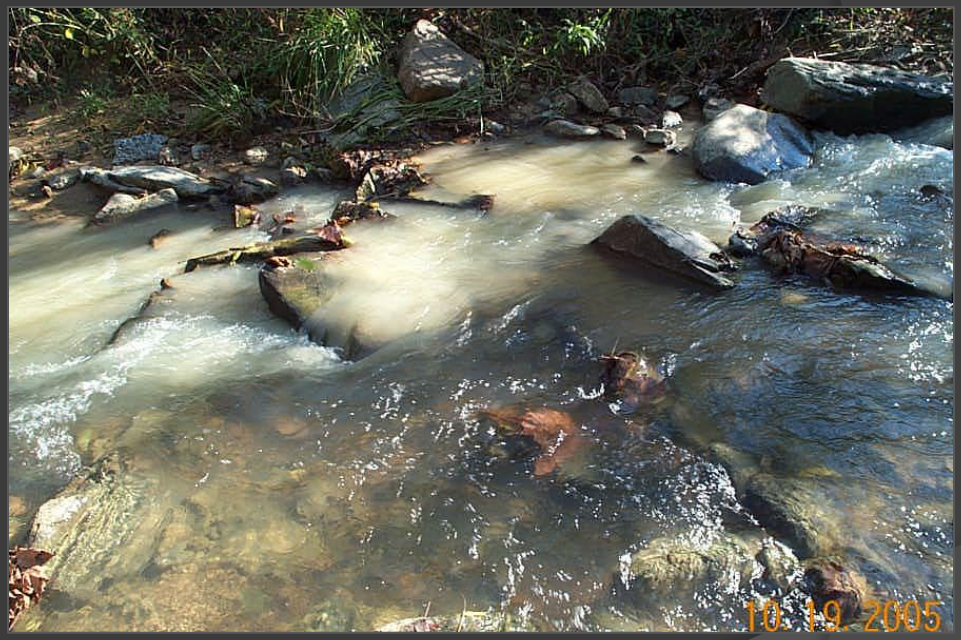
Review of the Studies:
Where is the bacteria coming from?

- *E. coli* is found in warm blooded animals
  - Humans
  - Wildlife
  - Livestock
  - Pets
- Some bacteria deposited on the land ends up in rivers and streams
- Impact of direct deposition of bacteria in rivers and streams

Failing septic drain field
Photo: Megan O'Gorek, SVSWCD

Review of the Studies:
Where is the sediment coming from?

- Stormwater
  - Exposed soil from land disturbing activities
  - Streets and parking lots and other paved surfaces
  - High flows causing erosion in stream channels
- Lack of stream-side vegetation



Bacteria Reductions Needed to Remove Roanoke River, Wilson Creek, and Ore Branch from the "Dirty Waters List"

Watershed	% Reduction by Source			
	Livestock Direct Deposit	Agricultural Runoff	Failing Septic Systems & Straight Pipes	Wildlife Direct Deposit
Wilson Creek	100%	99.5%	100%	89%
Ore Branch	100%	99.5%	100%	92%
Roanoke River	100%	98.8%	100%	61%

Bacteria TMDLs for Roanoke River, Ore Branch and Wilson Creek Watersheds (2006)

Sediment Reductions Needed to Remove Roanoke River from the "Dirty Waters List"

Watershed	% Reduction by Source			
	Land (including MS4* Permits)	Agricultural Runoff	River & Stream Channel Erosion	Residential & Urban
Roanoke River	69.5%	69.5%	69.5%	69.5%

* MS4 = Municipal Separate Storm Sewer System

Benthic TMDLs for Roanoke River Watersheds (2006)

Bacteria Reductions Needed to Remove Tinker Creek, Glade Creek, Carvin Creek, Lick Run and Laymantown Creek From "Dirty Waters List"

Watershed	% Reduction by Source					
	Live-stock Direct Deposit	Pasture & Cropland Runoff	Straight pipes & failing septic	Residential & Urban Runoff	Wildlife Direct Deposit	Wildlife Runoff
Laymantown Creek	75%	75%	100%	75%	20%	20%
Lick Run	75%	75%	100%	75%	20%	20%
Glade Creek	75%	75%	100%	75%	20%	20%
Carvin Creek	75%	75%	100%	75%	20%	20%
Tinker Creek	75%	75%	100%	75%	20%	20%

Bacteria TMDLs for Glade Creek, Tinker Creek, Carvin Creek, Laymantown Creek and Lick Run (2004)

Land Use is a major driver of pollutant loading

Since the development of the original TMDL, there have been land use changes and the unit area loads were updated as follows:

Part I Landuse Distribution and Comparison							
Landuse	Developed	Cropland	Pasture/Hay	Forest	Water/ Wetlands	Other	Total
NLCD 1992 Acres	35,677	1,080	29,010	139,761	1,722	2,173*	209,423
NLCD 2006 Acres	71,656	213	18,614	116,537	1,479	923**	209,423
Percent Change	**100.9%**	**-80.2%**	**-35.8%**	**-16.6%**	**-14.1%**	**-57.5%**	

Part II Landuse Distribution and Comparison							
Landuse	Developed	Cropland	Pasture/Hay	Forest	Water/ Wetlands	Other	Total
NLCD 1992 Acres	2,274	3,678	23,150	131,975	225	743*	162,046
NLCD 2006 Acres	13,878	1,216	20,179	126,504	140	130**	162,046
Percent Change	**510.2%**	**-67.0%**	**-12.8%**	**-4.1%**	**-37.8%**	**-82.4%**	

* NLCD 1992 “Other” includes Quarries/Strip Mines/Gravel Pits, Transitional, and Urban/Recreational Grasses

**NLCD 2006 “Other” includes Barren Land, Grassland/Herbaceous, and Shrub/Scrub

What is in the plan?

Subwatersheds* covered by Part I Clean-up Plan

* *Subwatershed = a smaller piece of a larger watershed associated with drainage areas that feed a tributary stream*

Legend

- Impaired Segments
- Study Area
- County
- Waterbodies
- Streams and Rivers
- Cities
- Back Creek
- Carvin Creek
- Glade Creek
- Lick Run
- Mason Creek
- Mud Lick Creek, Murray Run, and Ore Branch
- Peters Creek
- Roanoke River 1
- Roanoke River 2
- Tinker Creek

N W E S

0 1 2 4 Miles

Roanoke Valley Alleghany Regional Commission

DEQ Virginia Department of Environmental Quality

DCR Virginia Department of Conservation & Recreation

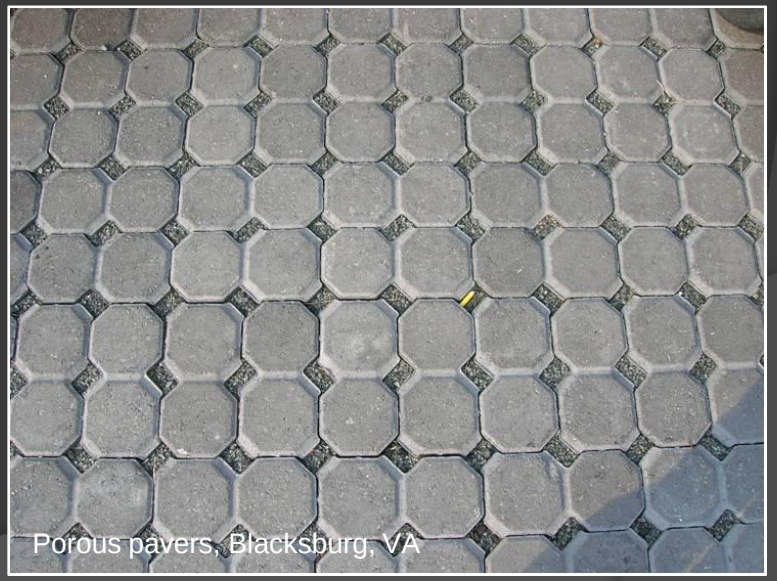
THE Louis Berger Group, INC.

VA INDEX MAP

What is in the plan?

- Updated landuses & pollutant reductions
- Actions to improve water quality (BMPs)
- Outreach strategies
- Costs and benefits
- Funding opportunities
- Project timeline
  - Implementation goals
  - Implementation milestones


Rain Garden, Wetland Studies & Solutions, Manassas, VA


Porous pavers, Blacksburg, VA

Failing Septic Systems and Straight Pipes (Residential)

BMP	Units	Extent
Septic tank pump-out	Pump-out	2,255
Connection to public sewer	Connection	2,427
Septic system repair	System	1,648
Septic system replacement	System	1,783
Alternative waste treatment system	Systems	166

From DRAFT Roanoke River Watershed Clean-up Plan (Part I)

Pet Waste Management (Residential)

BMP	Units	Extent
Pet Waste Management Education Program	Program	Program Per Subwatershed
Pet Waste Station	Station	98

From DRAFT Roanoke River Watershed Clean-up Plan (Part I)

Detention Pond Retrofits and Existing BMP Expansion (Urban)

BMP	Units	Extent
Infiltration Trench	System	234
Constructed Wetlands	System	263
Street Sweeping*	Curb Mile	8,675

*additional miles to be swept annually through the expansion of the City of Roanoke and Salem's Existing Programs, and a creation of a program in Roanoke County (still TBD if occurring/who will manage)

From DRAFT Roanoke River Watershed Clean-up Plan (Part I)

Stormwater BMPs (Urban)

BMP	Units	Extent
Bioretention	Acre Treated	11,700
Rain Gardens	Acre Treated	2,340
Infiltration Trench	Acre Treated	2,329
Manufactured BMPs	Acre Treated	2,824
Constructed Wetland	Acre Treated	34,371
Detention Pond	Acre Treated	1,960
Permeable Paver	Acre Treated	45
Vegetated Swale	Acre Treated	1,350
Rain Barrel	System	2,407
Riparian Buffer: Forest	Acre Installed	205
Riparian Buffer: Grass/Shrub	Acre Installed	205
Urban Tree Canopy/Landuse Conversion	Acre Converted	398

From DRAFT Roanoke River Watershed Clean-up Plan (Part I)

Agricultural Best Management Practices: *Pasture*

BMP	Units	Extent
Livestock Exclusion (CRSL-6)	System	13
Livestock Exclusion (SL-6T/LE1-T)	System	183
Livestock Exclusion with Reduced Setback (LE-2T)	System	21
Small Acreage Grazing System (SL-6AT)	System	10
Stream Protection/Fencing (WP-2T)	System	5
Manure Storage (WP-4)	System	4
Reforestation of Erodible Pasture (FR-1)	Acre Installed	1,710
Pasture Management (EQIP 528, SL-10T, SL-9)	Acre Installed	16,737
Vegetative Cover on Critical Areas (SL-11)	Acre Installed	3,061
Wet Detention Pond	Acre Treated	1,465

Agricultural Best Management Practices: *Cropland*

BMP	Units	Extent
Continuous No-Till (SL-15)	Acre Installed	151
Small Grain Cover Crop (SL-8)	Acre Installed	122
Permanent vegetative cover on cropland (SL-1)	Acre Installed	5
Sod Waterway (WP-3)	Acre Installed	11
Cropland Buffer/Field Borders (CP-33 and WQ-1)	Acre Installed	5

Stream Restoration

BMP	Units	Extent
Stream Restoration	Feet	68,879

From DRAFT Roanoke River Watershed Clean-up Plan (Part I)

Photo courtesy of Virginia Department of Game & Inland Fisheries

Education and Outreach

- Focus on economic benefits of agricultural BMPs
- Pet Waste Education Campaigns
  - HOAs
  - Veterinarian Offices & Kennels
- Septic System Maintenance
- Stormwater BMP Workshops for Businesses
- Develop and distribute educational materials at ongoing events
  - Waterway Clean-ups
  - Home Shows

What funding sources are available?

- USDA Programs - CREP/EQIP
- Water Quality Improvement Fund
- National Fish and Wildlife Foundation Grants
- EPA 319 Funds (available through DEQ)
- State Revolving Loan Funds
- State Cost-Share Program and Tax Credits

Photo: Jeff Vanuga, NRCS

How did we get to this point?

Meeting Date	Meeting Type	# of Attendees
10-Apr-13	Steering Committee	27
13-Jun-13	Open House - IP Kick-off	57
20-Jun-13	Agricultural & Residential Working Group	17
	Business Working Group	15
27-Aug-13	Government Working Group	20
21-Nov-13	Steering Committee	32
27-Feb-14	Agricultural & Residential Working Group	14
	Business Working Group	13
28-Feb-14	Government Working Group	26
20-Aug-14	Steering Committee	28
20-Apr-15	Steering Committee	30
30-Apr-15	Public Meeting - Part I Final, Part II Kick-off	___

What's next?

Part I: Implement the plan…

- Voluntary implementation
- Agricultural BMP implementation through Soil and Water Conservation Districts and Natural Resource Conservation Service
- Pursue grant opportunities for residential & stormwater BMPs
- Citizen monitoring

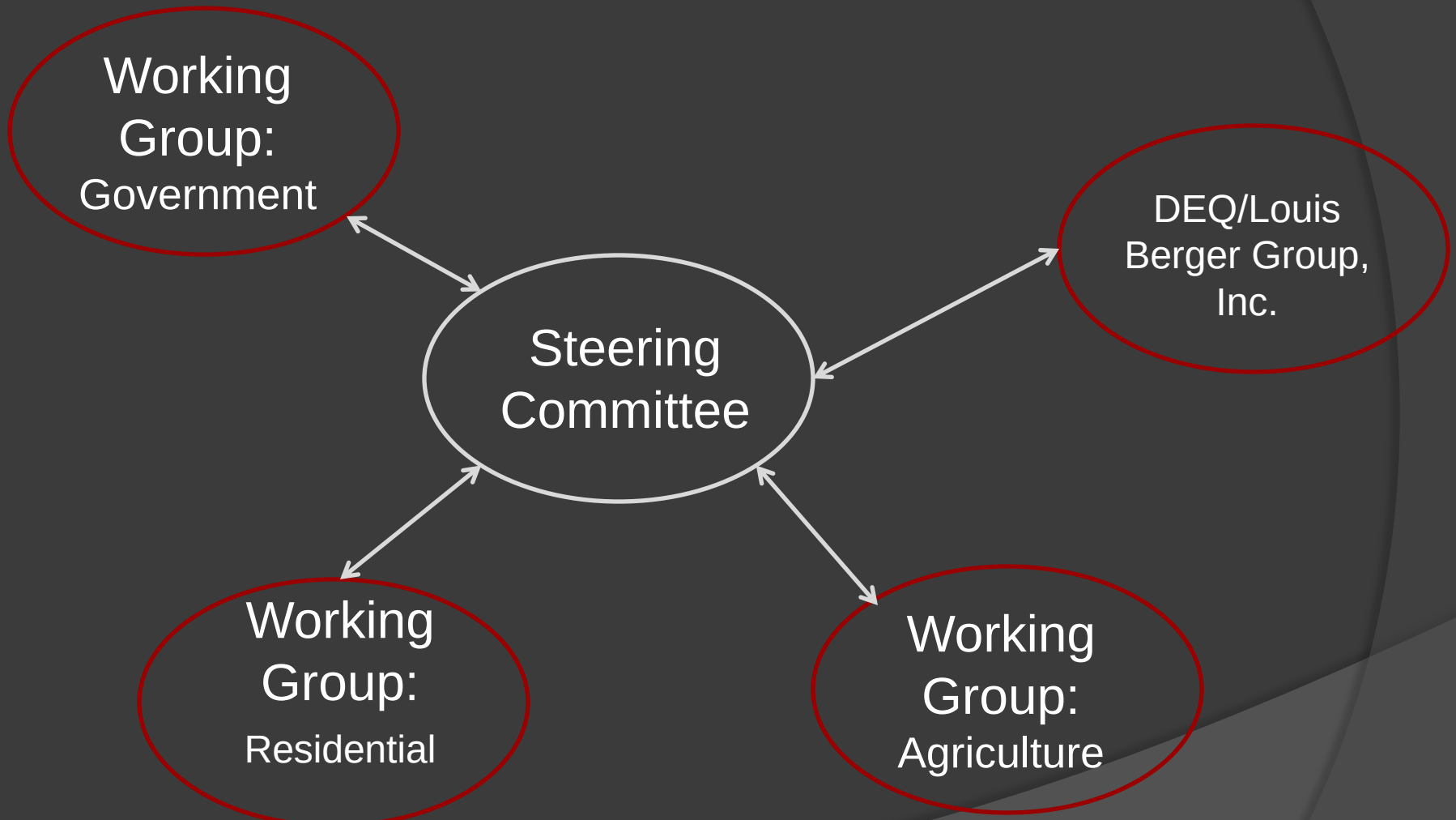
Part II: Develop the plan…

- Form a Steering Committee
- Form Working Groups
  - Agricultural
  - Residential
  - Government

1st Meeting: 6/16/15 6-8 p.m.

- Collaborate and identify BMPs to address bacteria sources

What's next?


Working Group: Government
DEQ/Louis Berger Group, Inc.
Steering Committee
Working Group: Residential
Working Group: Agriculture

Why should you participate?

- Economic benefits
  - Agricultural producers
  - Homeowners
  - Local economy
- Water quality benefits
  - Environmental
  - Human health
  - We all live downstream!

Roanoke Valley Alleghany Regional Commission Initiatives

- Blueways
- Roanoke Valley Livability Initiative

Roanoke Valley-Alleghany
REGIONAL
commission

Public Comment Period for Part I

- April 30, 2015 – June 1, 2015
- Send written comments to:

  Mary Dail

  Virginia Department of Environmental Quality

  3019 Peters Creek Road

  Roanoke, VA 24019

  Email: mary.dail@deq.virginia.gov

Thank you!

- General Questions
- Please visit the informational tables:
  - Water Quality Studies – TMDLs (Total Maximum Daily Loads)
  - Two Clean-up Plans:
    - Roanoke River Watershed Clean-up Plan (Part I)
    - North Fork & South Fork Roanoke Rivers Clean-up Plan (Part II)
  - Part II Working Group Sign-ups
  - Water Quality Monitoring
  - Roanoke Valley Alleghany Regional Commission
  - Tourism and Recreation: Water Quality Matters!